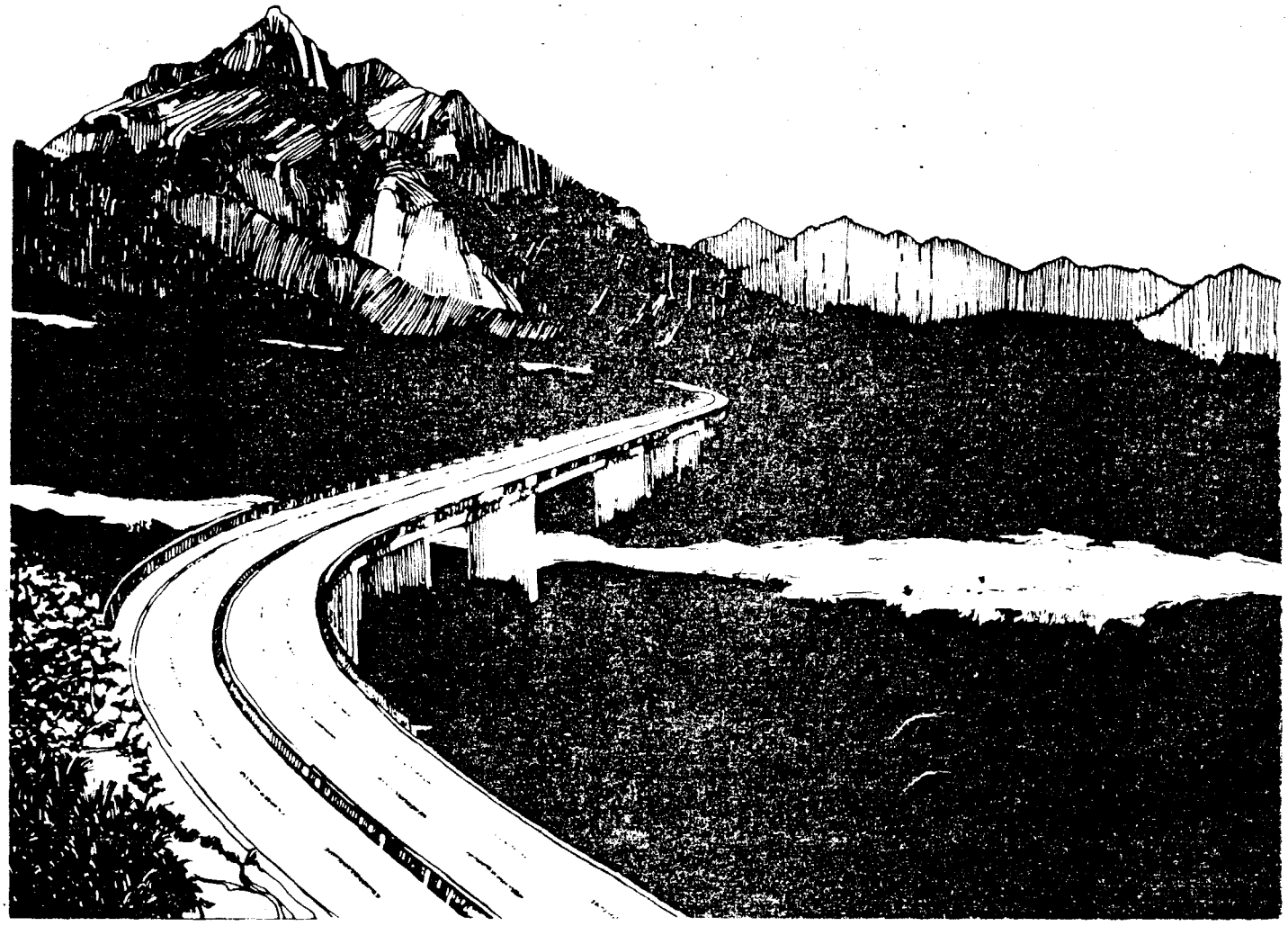
U.S. Department
of Transportation

**Federal Highway
Administration**

Office of Environmental Policy

Visual Impact Assessment for Highway Projects



Publication No. FHWA-HI-88-054

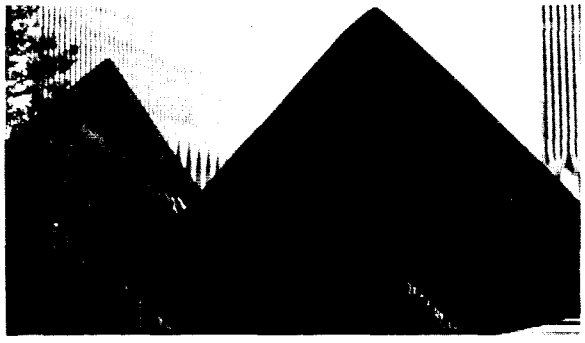
VISUAL CHARACTER

We do not simply experience the visual environment one object at a time; we experience the visual environment as an integrated whole. Our visual understanding or cognition of that environment is based on the *visual character* of objects and the relationships between these objects. The assessment of visual character is descriptive and not evaluative; that is, it is based on defined attributes that are neither good nor bad in themselves. Nevertheless, there can be strong public preference for the established visual character of a district and strong resistance to a project that would contrast with that character.

Descriptions of visual character can distinguish at least two levels of attributes: pattern elements and pattern character. Visual *pattern elements* are primary visual attributes of objects; they include form, line, color, and texture. The *form* of an object is its visual mass, bulk, or shape. *Line* is introduced by the edges of objects or parts of objects. The *color* of an object is both its value or reflective brightness (light, dark) and its hue (red, green). *Texture* is apparent surface coarseness. Our awareness of these pattern elements varies with distance. From afar, only the largest objects are seen as individual forms and we may see a city hillside as a textured surface. Distance also attenuates the intensity of colors.

The visual relationships between these pattern elements can be important secondary visual attributes of an object or an entire landscape. For example, there is a great difference between the visual character of a two-lane country road and an eight-lane freeway, although both may exhibit similar line, color, and texture. The visual contrast between a highway project and its visual environment can frequently be traced to four aspects of *pattern character:* dominance, scale, diversity, and continuity.

Specific components in a landscape may be visually *dominant* because of position, extent, or contrast of basic pattern elements. *Scale* is the apparent size relationship between a landscape component and its surroundings; an object can be made to look smaller or larger in scale by manipulating its visual pattern elements. Visual *diversity* is a function of the number, variety, and intermixing of visual pattern elements. *Continuity* is the uninterrupted flow of pattern elements in a landscape and the maintenance of visual relationships between immediately connected or related landscape components.



Visual character: form is the most prominent pattern element in this man-made setting.

The horizontal line of this fresh highway cut contrasts with the characteristic diagonal lines in the natural landscape.

5 CHARACTERISTICS OF VIEWERS

Visual experience is a compound of visual resources and viewer response. To understand and predict viewer response to the appearance of a highway projects, we must know something about the viewers who may see the project and the aspects of the visual environment to which they are likely to respond. Vision is an active sense; we usually have some reason for looking at the landscape and what we see is unconsciously conditioned by what we are looking for. How we feel about what we see is conditioned by other human factors; many of these are shared among large groups of people and may be important for project planning.

Viewer Groups and Viewer Exposure

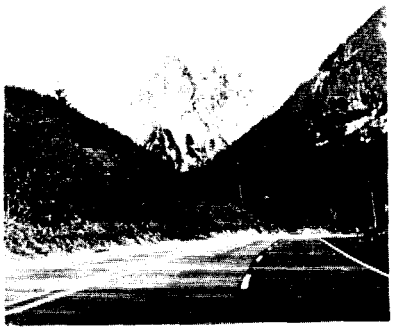
Visual perception is the basic act of seeing or recognizing an object. Naturally, we assume an unobstructed sightline, but other physical conditions can also affect perception. As observer distance increases, the ability to see the details of an object decreases. As observer speed increases, the sharpness of lateral vision declines and the observer tends to focus along the line of travel.

We can differentiate major *viewer groups* by physical factors that modify perception. For highway projects, we begin with the basic distinction of the view from the road (highway users) and the view of the road (highway neighbors). We can use viewshed mapping to further categorize these viewer groups by *viewer exposure:* the physical location of each viewer group, the number of people in each group, and the duration of their view.

Viewer Sensitivity

The receptivity of different viewer groups to the visual environment and its elements is not equal. This variable receptivity is *viewer sensitivity* and is strongly related to visual preference. It modifies visual experience directly by means of viewer activity and awareness; indirectly, sensitivity modifies experience by means of values, opinions, and preconceptions. High viewer sensitivity can be critical to project planning and design because it heightens viewer response and increases the importance of visual resource issues. In a few cases, high viewer sensitivity may tend to discourage any visible change to the project environment.

Activities such as commuting in heavy traffic or working on a construction site can distract an observer from many aspects of the visual environment. Head-mounted cameras, for instance, have demonstrated that a driver can look directly at a landmark and still not see it. On the other hand, activities such as driving for pleasure or relaxing in scenic surroundings can encourage an observer to look at the view more closely and at greater length. Therefore, *viewer activity* is another identifying characteristic of viewer groups.

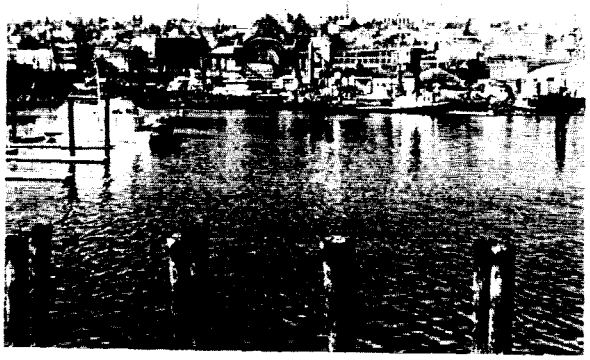


This dramatic mountain gateway heightens the visual awareness of highway travelers.

For example, we may well want to distinguish among project viewers located in residential, recreational, and industrial areas.

Viewer awareness is the extent to which the receptivity of viewers is heightened by the immediate experience of visual resource characteristics. Visual change heightens awareness: a landscape transition, such as entering a mountain range or a major city, may heighten viewer awareness for a number of miles along a road. Measures that modify viewer exposure, such as selective clearing or screening, may also be deliberately employed to modify viewer awareness. For example, we well may want to distinguish among project viewers located in residential, recreational, and industrial areas.

Local values and goals operate indirectly on viewer experience by shaping view expectations, aspirations and appreciations. If the existing appearance of a project site is uninspiring, a community may still object to projects that fall short of its visual goals. At a regional or national level, viewers may be particularly sensitive to the visual resources and appearance of a particular landscape as a result of its *cultural significance*. This significance may be due to the presence of historic values, scientific or recreational resources, or other unique features; any visible evidence of change may be seen as a threat to these values or resources.



An elevated highway would traverse the unsightly industrial area on the other side of this waterway. Nevertheless, there has been strong public concern over the visual effects of the highway on future redevelopment and on the historic railroad station in the middle distance.

VIEWER GROUPS

Classes of viewers which differ in their visual response to the highway and its setting. Response is affected by viewer location, activity, and values.

GROUPS WITH A VIEW FROM THE ROAD

- *driver*
- *passenger*

GROUPS WITH A VIEW OF THE ROAD IN THE LANDSCAPE SETTING

- *residents*
  - *urban & suburban*
  - *rural*
- *commercial/industrial interests*
- *recreational groups*
  - *park, resort, overlook, & historic site visitors*
  - *river and lake users*
  - *scenic railroad passengers*
  - *trail users*
- *other special interest groups*
  - *civic*
  - *cultural*
  - *environmental*
  - *educational*
  - *economic*

GROUPS WITH A VIEW OF THE ROAD FROM THE ROADSIDE

- *wayside and rest area users*
- *cyclists and other traffic in right-of-way*

COMPARISON: Two Basic Groups

	HIGHWAY NEIGHBOR VIEW OF THE ROAD	HIGHWAY USER VIEW FROM THE ROAD
← Physical →	Maximum acuity	Reduced acuity
	Comprehensive field of vision	Narrowed cone of vision
	No constraint on vision	Point of concentration
← Psychological →	Desire for visual detail	Need for visual simplicity
	Viewer costs	Viewer benefits
	Visual problems	Visual opportunities

VIEWER EXPOSURE

The degree to which viewers are exposed to a view by their physical location, the numbers of people viewing and the duration of view

PHYSICAL LOCATION:

- distance zones
  - foreground
  - middle ground
  - background
- observer position
  - superior
  - normal
  - inferior
- direction of view
  - north
  - south
  - east
  - west

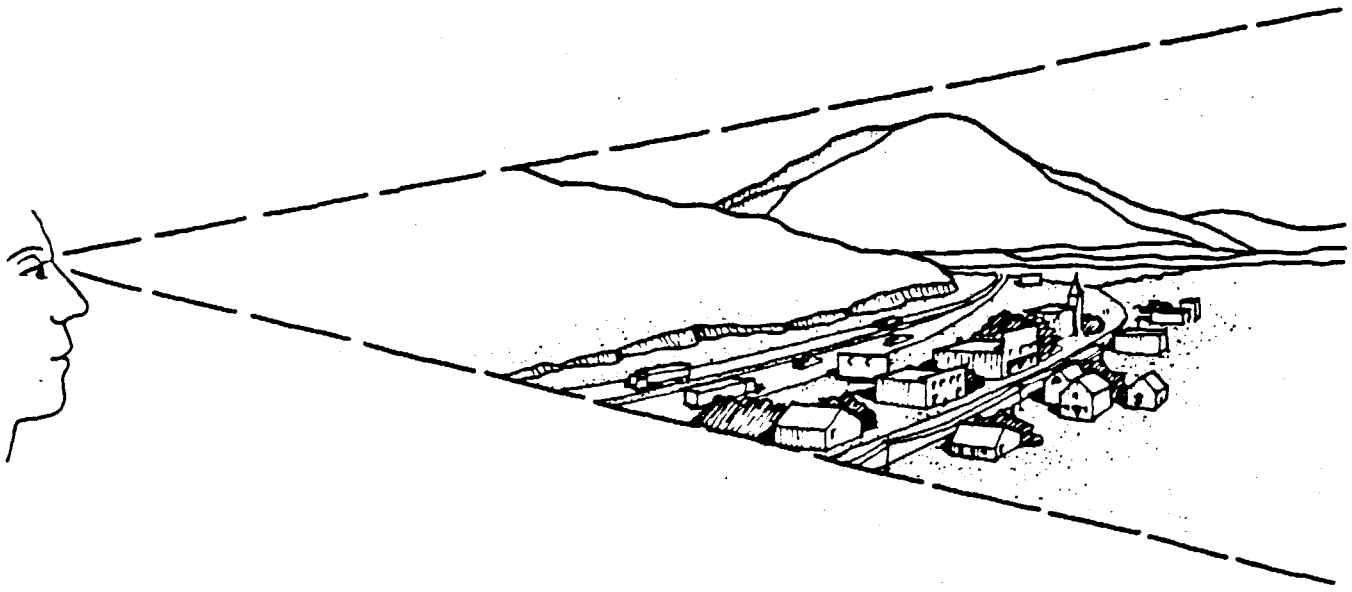
NUMBER OF VIEWERS:

- residents
- visitors
  - view <u>of</u> the road
  - view <u>from</u> the road

DURATION OF VIEW:

- frequency of exposure
- stationary view
- moving view

VIEWER SENSITIVITY



The preferences, values, and opinions of different viewer groups can be documented in the following ways:

- viewer activity & awareness
- local values
- cultural significance of the visual resource

ACTIVITY & AWARENESS

The degree to which viewers are likely to be receptive to the visual details, character, and quality of the surrounding landscape. Two principal factors affect viewer sensitivity: activity and awareness.

· Viewer Activity

A viewer's ability to perceive the landscape is affected by his activity. In a particular landscape setting, viewer activity may:

1) encourage him to look at the landscape, such as pleasure driving, or

2) distract him from the landscape, such as commuting in heavy traffic.

· Viewer Awareness

A viewer's receptivity to the visual character of the landscape can be affected by the landscape setting itself, or by expectations about the setting. Major variables are:

1) viewing position, such as an overlook or a position near a major landmark,

2) recent visual experience, such as a landscape transition, and

3) individual preconceptions about the landscape (and the highway's appropriateness in it).

CULTURAL SIGNIFICANCE

At a regional or national level, viewers may be particularly sensitive to the visual resources and appearance of a particular landscape because of:

· History

The landscape may commemorate some historic event.

· Scientific or Recreational Resources

The landscape may be singled out and widely known for values - scientific, recreational, esthetic - directly connected with its appearance.

· Uniqueness

Its visual resources, character or quality may be uncommon or rare in the region or nation.

LOCAL VALUES

The visual appearance of certain landscapes and certain visual resources within these landscapes may be important to the local community because of:

- *Local Visual Preferences*
- *Local Historical Associations*
- *Local Aspirations and Goals*

The highway agency's community involvement program can help to identify visual resources affected by local values and goals.

VIEWER RESPONSE

VIEWER EXPOSURE

- viewshed
- viewing groups and numbers
- viewer location, distance and position
- view duration and frequency

VIEWER SENSITIVITY: ACTIVITY AND AWARENESS

- current viewers
- new viewers

VIEWER SENSITIVITY: LOCAL VALUES

- current local values and plans
- project impacts on these values

VIEWER SENSITIVITY: CULTURAL SIGNIFICANCE

- existing historic, scientific, unique or recreation resources
- elimination or change of the resource and its setting